EASTERN UNIVERSITY, SRILANKA

FIRST YEAR FIRST SEMESTER EXAMINATION IN AGRICULTURE 2008/2009

(March/April 2010)

AEN 1101 – APPLIED MECHANICS (1:15/00)

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02 JUN 2010
Eastern University, Sri Lanka

Answer all questions

Time : 01 Hour

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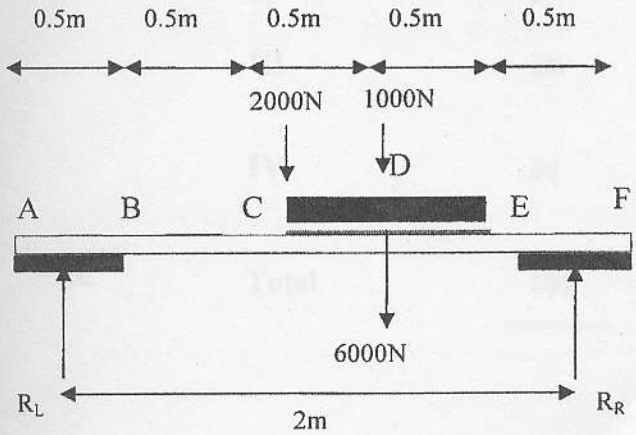
01. (a) State the laws of friction

(b) Write down the three forms of mechanical energy with suitable equations.

02. A horizontal beam ABCDEF is 2.5m long and AB=BC=CD=DE=EF=0.5m. The ends rest on broad supports, giving uniformly distributed reactions over AB and EF. A concentrated load of 2000 N acts at C, and 1000 N at D. In addition, a uniformly distributed load of 6000 N extends over the length CE as shown below.



(i) Calculate the reaction at each support.(Assume that the reaction at either end acts through the midpoint of the supporting length)

(ii) Calculate the shear forces and draw the sheer force diagram.

(iii) Calculate the bending moments and draw the bending moment diagram

(PTO)

03. (a) Define young's modulus of elasticity and strain energy.

(b) When a 300 kg mass is suspended from a steel wire of length 2 m and area 1.96 its length increases. The temperature of the wire after loading was found to be Young's modulus of steel is 2×10^{11} Nm^{-2}. If the coefficient of linear expansion of is 1.1×10^{-5} C^{-1}, Find;

(i) The stress in the system

(ii) The strain

(iii) Increase in length of the steel wire

(iv) Elastic potential energy stored in the wire

(v) Tension in the wire in the loaded position

(vi) The change in tension of the wire, when the loaded wire is allowed to cool $30\ ^0C$ to $26\ ^0C$.